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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,598	02/10/2004	Po Jen Cheng	4459-090A	8879

7590

06/02/2004

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EXAMINER

HOLLINGTON, JERMELE M

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. **10/774,598**

Applicant(s) **CHENG ET AL.**

Examiner **Jermele M. Hollington**

Art Unit **2829**

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

The examiner acknowledges of the cancellation of claims 1-5 in the Preliminary Amendment filed on February 10, 2004.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 6-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsieh (6564986).

Regarding claim 6, Hsieh discloses [see Figs. 4-5] a test assembly (assembly 200) for an integrated circuit package, the test assembly (200) comprising: a package substrate (BGA IC package 120A) having a plurality of first contact pads (contact pads 125) adapted for receiving solder bumps (solder balls 126) and a plurality of first conductors (bond wires 205) connecting selected pairs of said first contact pads (125); and a test board (printed circuit board 210) having a plurality of second contact pads (contact pads 215), a pair of major test pads (test pads 225-1 and 225-2), a plurality of minor test pads (intermediate pads 311-315 shown in Fig. 7 connected to printed circuit board 310) connected to selected ones of said second contact pads (215), and a plurality of second conductors (conductive lines 220) connecting selected pairs of the second contact pads (215), wherein all of the second contact pads (215) are divided into a plurality of groups such that all of the second contact pads (215) in the same group are arranged in a line [see Fig. 5], wherein, when the package substrate (120A) is mounted on the test board (210) with

each of said solder bumps (126) soldered to one of the first contact pads (125) and one of the second contact pads (215), all of the pairs of connected second contact pads (215) and the corresponding pairs of connected first contact pads (125) form a conductive path [known as daisy chain] that passes through all of the solder bumps (126) [see col. 5, lines 11-21 and col. 6, lines 6-27], each of said groups of connected second contact pads (215) and the corresponding connected first contact pads (125) form a closed circuit through all of the solder bumps (126) there between when said major test pads (225-1 and 225-2) are probed, and when one pair of the minor test pads (311 and 312) is probe, only one of said groups of the second contact pads (215) and the corresponding connected first contact pads (125) form another closed circuit through all of the solder bumps (126) there between.

Regarding claim 7, Hsieh discloses all of the second contact pads (215) belong to the closed circuit when the major test pads (225-1 and 225-2) are probed.

Regarding claim 8, Hsieh discloses the package substrate (120A) is a ball grid array substrate [see col. 1, lines 20-21 and col. 4, lines 50-54].

Conclusion

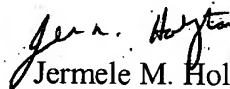
3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Zhao et al (6207476), Goto et al (6245599), Brooks et al (6326244) Huemoeller et al (6534391) and Yoneda et al (5654243) disclose a method and apparatus for fabricating a semiconductor package and testing a solder bumps.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermele M. Hollington whose telephone number is (571) 272-1960. The examiner can normally be reached on M-F (9:00-4:30 EST) First Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (517) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jermele M. Hollington
Examiner
Art Unit 2829

JMH
May 25, 2004